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TREE REMOVAL AND STREAM BANK  
PROTECTION

TASK FORCE REPORT



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TREE REMOVAL AND STREAM BANK

PROTECTION


TASK FORCE REPORT

PREPARED FOR THE

CONSERVATION AND UTILIZATION COMMITTEE

EDMONTON, ALBERTA

SEPTEMBER, 1971



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MEMBERS OF THE TASK FORCE

- |     |                                    |   |   |
|-----|------------------------------------|---|---|
| 1.  | D. G. Harrington (Chairman)        | - | Water Resources Division,<br>Land Development Branch                    |
| 2.  | F. J. Schulte (Secretary)          | - | Water Resources Division,<br>Development Planning Branch                |
| 3.  | B. W. Boyson                       | - | Water Resources Division,<br>External Administration Branch             |
| 4.  | J. R. Gylander                     | - | Program Development Division,<br>Municipal Agricultural Programs Branch |
| 5.  | A. W. Goettel                      | - | Plant Industry Division,<br>Soils Branch                                |
| 6.  | A. Isbister                        | - | Municipal Affairs,<br>Field Service Branch                              |
| 7.  | J. Markovich                       | - | Lands Division,<br>Special Land Uses Branch                             |
| 8.  | R. J. Paterson and<br>J. B. Kemper | - | Fish and Wildlife Division  |
| 9.  | F. W. McDougall                    | - | Alberta Forest Service,<br>Timber Management Branch                     |
| 10. | L. Yule                            | - | Lands Division  |



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## TREE REMOVAL AND STREAM BANK

### PROTECTION

The terms of reference for the task force were broadly as follows:

1. Obtain a broader interpretation and application of the Land Conservation Rules.
2. Examine existing regulation to determine their effectiveness and any need for change or updating.
3. Investigate the need for enforcement, programs, zone adjustments, co-ordination, and service to the public that would encourage positive attitudes and action.

The resources represented on the task force were Soils, Forestry, Fish and Wildlife, and Water. The users represented were Agricultural Service Boards, Municipal Affairs, Provincial Parks, and the Lands Branch.

It was recognized at the outset that the problem of tree removal and stream bank protection had to be considered from the point of view of land ownership; that is, crown lands versus patented lands. The government does have legislation to protect streams and control clearing on crown lands, therefore any problems are of an internal nature which relate to policy. Patented and municipally owned lands are primarily used and managed as best suits the needs of the owner. There is little or no legislation to specifically protect land adjacent to water courses once the land is privately owned.

Stream bank protection and tree removal is only one part of land use planning. To date most of our land use policies have been short term primarily because of the rights invested with ownership. Land adjacent to water courses must be considered as part of the natural drainage system. There is ample evidence as to the undesirable effects that non compatible





uses have on water quantity, quality, and rate of flow. The solution to these problems must be implemented through the Regional Planning process and supported by Provincial and Local Government policy.

William Wood, Jr. discusses "A Policy for Land Use" in the February 1971 issue of the Journal of Soil and Water Conservation. This article has been included in Appendix I as background information.

## PROBLEMS

Stream bank deterioration is primarily due to man's activities. Water courses are part of a dynamic system which is continuously changing. Some of the main factors involved are gradient, annual flow frequencies and type of stream bed material. Depending upon the combination of these factors, various stream patterns will evolve. Few problems would arise from this process if adequate land were left undisturbed as a buffer zone on either side of the water course. Severe changes in river regime may also occur if man's activities in the headwater zone alter or disrupt the vegetative cover. This usually results in increased runoff over a shorter period of time. Annual variations in precipitation will also cause increased runoff. The point here is that man's activities tend to accelerate erosion.

In the Green Zone damage to water courses and adjacent areas results primarily from resource exploration and development by oil, gas, forest, and mining industries. Associated with this is the damage caused by the general public as a result of increased access to hunting, fishing, and recreational areas. The committee recognizes that these problems are being investigated and studied in detail by other agencies, i.e. Foothills Resource Allocation Study, Surface Reclamation Task Force, Land Use





assignment committee, and Provincial Planning Branch. Any further investigation by this task force would be a duplication of effort.

The problems associated with patented lands results from land clearing, cultivation, building adjacent to river banks, developments within flood plains, uncontrolled drainage of farm lands, interruption of natural drainage channels by secondary and local road building, inadequate location of bridges and culverts, gravel operations, feedlots, and garbage disposal. Erosion, pollution, sedimentation and disruption of aesthetic values result if these activities are not well planned and managed.

#### DEFINITION OF LAND AREAS INVOLVED

The acceptance of some criteria is necessary to delineate the land areas required for stream bank and watershed protection. The Land Conservation Rules have been updated by the committee for this purpose (Appendix 2). Sections 7 through 10 have been added to specifically cover merchantable timber. We would propose that these criteria be used by the Assessment Branch and Planning Branch, Department of Municipal Affairs, Forest Division Land Use Planning Branch, Lands Division, Land Use Branch, Department of Lands and Forests, and The Regional Planning Commissions. It should be recognized that these criteria are minimum guidelines in that they attempt to provide the maximum opportunity for integrated land use. There will be situations where criteria will be established by resource managers and local government agencies to meet specific situations.

#### RECOMMENDATIONS

The long term solution to adequate stream bank protection is through comprehensive land use planning. Therefore government policy should support and encourage regional planning activities. It is therefore recommended that:





1. Regional Planning Commissions designate watershed protection areas according to the Land Conservation Rules. The Provincial Planning Board should advise Regional Planning agencies of this requirement.
2. A government fund be established for the purchase of critical areas designated on the regional plan. It is realized that all such areas will not be purchased in any one year. However where an adopted Regional Plan exists funds should be available for land purchase.
3. Where funds are not sufficient for land purchases in a given year, a Caveat be placed against the title indicating the land is subject to purchase for conservation purposes.
4. Where erosion problems are temporary and may be corrected by conservation practices, the government enact legislation to take temporary title to the land to initiate conservation practices. Consideration should also be given to some method of cost sharing between the land owner, local government, and provincial government. Provision should be made to charge the major share of the cost to any person or organization that can be shown to have been at fault.
5.
  - (a) The government establish adequate engineering and agrologic design criteria for the prevention of erosion on road construction projects both provincially and locally.
  - (b) The Land Conservation Rules be adopted as guidelines for the location of roads.
  - (c) Where diversion and/or concentration of runoff is necessary for road building purposes excess water be conveyed to an adequate outlet beyond the right-of-way if necessary.





6. The Department of the Environment initiate and co-ordinate a program of education for all provincial and local government agencies on conservation needs, practices, and policies, using resource personnel both inside and outside of government.
7. Since several counties and Regional Planning Commissions have expressed concern over excessive tree removal and the need for stream bank protection, a pilot project be arranged with one of the interested counties for the purpose of devising the best method of implementation through an actual situation. Such a project is necessary because it is impossible for the task force to predict the total effect that may result from its proposals. It is also recommended that any funding required for the project be the responsibility of the Province.



## APPENDIX I

"A POLICY FOR LAND USE"<sup>1</sup>

Neither the United States nor most of its political subdivisions have an explicit land use policy. However, the federal government, state governments, and most local governments have an implicit one: decision-making rights inherent in ownership are paramount except when the intensity of urbanization elicits limited use restrictions on behalf of a nebulously defined public. Even this implicit policy is not uniformly applied.

Explicit public policy with respect to land use coincides exclusively with public ownership. To direct use, government in the United States historically has purchased land. Private ownership, in large measure, has remained inviolate, witness houses in slide areas or structures on the most fertile, flexible soils.

Land use policy statements are being developed with increasing frequency both at the state and national level. Little opposition is generated by most such policy suggestions because they remain essentially dedicated to the general good and defenders against evil. Public policy on land use is generally acceptable so long as it remains either sufficiently general to be inapplicable or refers to land owned by someone else.

An explicit land use policy must address itself to at least two facets of the land problem. One facet is technical: the physical, locational, climatic, and aesthetic characteristics of specific land areas that necessitate use policy. This sort of technical information must be supplied in part by soil scientists, engineers, geologists, and climatologists.

1

Wood, William, Jr., "A Policy for Land Use", Journal of Soil and Water Conservation, Vol. (?), (February 1971), pp. (?) - (?).





At present we probably have much of the necessary technical information if we would either use it or put it in appropriate form. Many presentations at land use planning conferences suggest that only a lack of coordination, incentive, or agreement on objectives is hindering progress.

The second facet of an explicit land use policy is more complex. We must come to realistic terms with two value problems: the rights of private ownership and local government control.

The "bundle of rights" associated with land ownership is well founded in both English common law and American constitutional law. The "bundle of rights" originates with ownership, and only in extreme cases are a few "sticks" removed in the "public interest". What may now be required is a complete transformation, within the accepted concept of stewardship. In essence, this facet of land use policy would suggest that the "bundle of rights" is a public good and that some of the "sticks" in that "bundle" are specifically delegated to the party or parties residing on, caring for, or otherwise using the land.

The second tenet, local governmental control, is just as dearly held by many Americans. Land use planning within the context of our present multilevel governmental fragmentation is a farce. Responsiveness of local government to local needs is one of the major attributes of local control; it is also the attribute that makes land use policy impotent at the local level. Local governmental officials are elected to make local decisions usually short-term in nature. Short-term decisions and land use policy are anathema, particularly in a market economy.

Illustrative of the conflict between local governmental land use decisions and optimum long-term resource planning is what might be termed the "chamber of commerce syndrome". In simplified terms, this syndrome





suggests that economic development, as locally perceived, is good 'as such'. The empirical observations that immediate expansion of economic activity is more than offset by both resource strain and disproportionate increases in the costs of local governmental services are ignored. The high probability that economic development may destroy the conditions that initially made the local area attractive to present as well as potential residents is likewise ignored. Thus local government continues to plan land use for short-term development in the face of a self-defeating cycle for even local preferences.

I am not so naive as to expect a complete change in value systems in order to develop and implement an effective land use policy. However, unless we clearly recognize the issues which tend to thwart optimum long-term land use, we will simply flounder as we have for years, thus gradually losing an irreplaceable resource. Furthermore, even at the state level in California, for example, we are not yet able to adequately coordinate land use policy, nor for that matter to develop a policy. Conflict among state agencies continues over land use, both public and private. By way of illustration, perhaps no agency is less capable, or less willing, to consider land use implications of public investment than the Division of Highways.

In a pluralistic society, policy development is the result of either strength or compromise. Not until we have lost a great deal more land to inappropriate long-term land use and find ourselves with a food shortage, congestion, or environmental crises of life or death proportions are we apt to develop an effective policy for land use. A few voices "crying in the wilderness", as it were, have neither the strength nor the bargaining tools with which to effect a compromise.



A policy for land use must have the following elements:

1. Legal ownership of land should not necessarily carry inalienable rights to use land as the owner sees fit: use determination is a responsibility of public policy.
2. Characteristics of land types which necessitate public decision as to use should be well defined; the Soil Conservation Society of America is quite aptly addressing itself to this problem at present.
3. Local responsibility and authority for land use planning and implementation should be restricted within narrow limits; optimum long-term use of land would be less subject to local pressure.

Short of these controversial elements, any policy for land use is apt only to alter the speed with which this resource is depleted rather than to meet the basic issue of direction in land use.





## APPENDIX 2

LAND CONSERVATION RULES

1. (1) In this section and sections 2 to 22,
    - (a) "land" means the land held by the landholder as registered owner, purchaser, homestead purchaser or homestead lessee, and on any part of which a land development project is or is to be carried out; and land contained within the boundaries of an active forest management agreement, a timber licence or timber permit.
    - (b) "water body" means the bed and shore of a lake, pond, marsh, slough or other permanent body of water but does not include a watercourse or surface water;
    - (c) "watercourse" means the bed, shore, and banks of a river, stream, creek or other watercourse whether the flow of water therein is continuous or intermittent.
    - (d) "inspector" includes any authorized employee of the Government of Alberta, including land inspectors, forest officers, agricultural inspectors and wildlife officers.
  - (2) Where doubt arises in determining distances from a watercourse or water body for the purpose of sections 4 to 6 by reason of the difficulty in determining the boundary of the bed, shore, or banks of a watercourse or water body, the distance shall be measured from the existing high water mark of the watercourse or water body.
2. Where the land
    - (a) has slopes greater than 5 per cent and longer than 1,320 feet, or





- (b) in the opinion of an inspector, would be subject to soil erosion from wind or water action if it were used for cereal crop or row crop production, or
- (c) in the opinion of an inspector would be subject to soil erosion from wind or water action if the timber growing thereon were completely removed,

the land involved in the land development project shall be protected by leaving undisturbed and undeveloped native vegetation in the form of contour shelterbelts or reserve stands or timber in such locations and of such width (not less than 100 feet) as the inspector determines, but if, in the inspector's opinion, the native vegetation in those shelterbelt or reserve stand locations is insufficient to provide protection from erosion, the inspector may require the planting of trees or grass, or partly trees and partly grass, in those shelterbelt locations, or may prescribe such alternate erosion control measures as are practicable under the circumstances.

3. (1) Subject to section 3 (4), where the land contains a coulee or a valley break, the landholder shall not develop or disturb that part of the land that lies within
- (a) 75 feet of the upper break of the coulee or valley where the average depth of the coulee or the valley break is less than 50 feet, or
  - (b) 150 feet of the upper break of the coulee or valley where the average depth of the coulee or the valley break is at least 50 feet and not more than 100 feet, or
  - (c) 200 to 1,320 feet of the upper break of the coulee or valley (whatever distance the inspector prescribes) where the average



depth of the coulee or the valley break is more than 100 feet and the slope faces generally in a northerly or easterly direction, or

(d) 200 to 2,640 feet of the upper break of the coulee or valley (whatever distance the inspector prescribes) where the average depth of the coulee or the valley break is more than 100 feet and the slope faces generally in a southerly or westerly direction.

- (2) An inspector may vary any of the requirements of subsection (1) in any particular case where in his opinion it is reasonable to do so having regard to the ecological or other physical conditions existing on the land.
- (3) In this section, "coulee" includes gully, ravine or any similar topographical feature.
- (4) Notwithstanding the above, merchantable timber may be harvested from within the limits prescribed by this section subject to the conditions set forth in section 4 and provided special considerations to safeguard the site are included in annual operating plans for the approval of an inspector.

- 4. (1) Where the land contains a watercourse, the landholder shall not develop or disturb that part of the land that lies within
  - (a) such distance (not greater than 100 feet) as the inspector prescribes, where the average width of the watercourse is less than 10 feet, or
  - (b) 100 feet on either side of the watercourse, where the average width of the watercourse is at least 10 feet and less than 50 feet, or





- (c) 150 feet on either side of the watercourse, where the average width of the watercourse is at least 50 feet and not more than 200 feet, or
    - (d) 200 feet on either side of the watercourse, where the average width of the watercourse is more than 200 feet.
  - (2) An inspector may vary any of the requirements of subsection (1) where in his opinion it is reasonable to do so provided the capability and quality of the watercourse will not be reduced or impaired in any way.
5. (1) Where the land borders on a water body or contains a water body within its boundaries and that water body is classified as having a waterfowl wildlife capability of class 4 or better or a water capability for sport fish of class 4 or better, the landholder shall not develop or disturb that part of the land that lies
- (a) within 100 feet of the water body, where the area of the whole water body is less than 10 acres, or
  - (b) within 200 feet of the water body, where the area of the whole water body is at least 10 acres and less than 40 acres, or
  - (c) within 300 feet of the water body, where the area of the whole water body is 40 acres or more.
- (2) Where the land borders on a water body or contains a water body within its boundaries and that water body is classified as having a waterfowl wildlife capability or water capability for sport fish of class 5, 6, or 7, the landowner shall not develop or disturb that part of the land that lies
- (a) within 100 feet of the water body, where the area of the whole water body is 40 acres or more, or



(b) within such greater or lesser distance as the inspector prescribes, in any other case.

6. (1) Where the land borders on a water body or contains a water body within its boundaries, the landholder shall not develop or disturb that part of the land that lies

(a) within 400 feet of the water body, where the outdoor recreation capability of that water body is class 4 or better, or

(b) where the outdoor recreation capability of that water body is class 5, 6, or 7, within such distance of the water body as the inspector prescribes, which shall be less than 400 feet but not less than any distance that applies under section 5.

(2) Where clause (a) of subsection (1) applies to the land, section 5 does not apply to that land.

7. Stream or Watercourse Reserves - Each watercourse shall be classified into one of three categories: main, secondary and other. Main and secondary watercourses shall be classified on a watercourse map. The three classes and reserve timber requirements for each are as follows:

(1) Main watercourses - major streams and rivers as designated on the watercourse map. Requirements:

(a) No roads, landings or bared areas to be located within 5 chains of the high water mark without the written approval of the Forest Superintendent,

(b) No disturbance of any kind and no removal of forest cover, within 3 chains of the high water mark except where specifically approved in writing following inspection by a Forest Officer,





- (c) Where removal of forest cover within 3 chains is approved, no skidder, scarifier or other machine to operate within 1 chain of the high water mark. Timber in the 1 chain area to be removed by winching or other means such that the machine will remain outside the 1 chain strip,
  - (d) Any trees felled within the 3 chain area to be felled away from the watercourse, and no debris or any kind to be allowed to enter the watercourse. Any debris or trees which accidentally or inadvertently enter the watercourse shall be immediately and completely removed (using winches) without the machine entering the watercourse.
- (2) Secondary watercourses - small but permanent streams as designated on the watercourse map, in two colors, one denoting areas of steep terrain and one denoting areas of gentle terrain. These color designations will serve for general planning purposes and for allowable cut calculation. In practice, gentle terrain will be defined for each location as it exists in the field. Grades of 25 per cent and less will be defined as gentle. Requirements:
- (a) No roads, landings or bared areas within 5 chains of the high water mark without the written approval of the Forest Superintendent.
  - (b) No disturbance of any kind, and no removal of forest cover, within 1.5 chains of the high water mark except in areas of gentle terrain where neither bank is strongly sloped, where removal may be allowed up to the high water mark following inspection and approval in writing by a Forest Officer.



- (c) Where removal of forest cover within 1.5 chains is approved in areas of gentle terrain, no skidder, scarifier or other machine to operate within 1 chain of the high water mark. Timber to be removed from the 1 chain area by winching or other means such that the machine will remain outside the 1 chain strip.
  - (d) Any trees felled within the 1.5 chain area to be felled away from the watercourse unless otherwise approved in writing by a Forest Officer, and no debris or slash to enter the watercourse. Any debris or trees which accidentally or inadvertently enter the watercourse shall be immediately and completely removed (using winches) without the machine entering the watercourse.
- (3) Other watercourses - generally definable only on the ground, not designated on the watercourse map.

The Department will request and discuss with the company any special treatment required regarding pertinent portions of other watercourses in any operating area prior to the approval of any annual operating plan or intermediate road or cutting plan submissions. The Department's proposals will be delineated for special safeguard by the company after mutual agreement.

- (a) Wherever feasible, the company will not construct roads within such watercourses.
- (b) Where road construction is required across or along such watercourses, all obstructions must be removed after post-logging treatment and erosion control measures will be implemented during construction and use in accordance with



any road construction standards which may be officially established for the agreement area.

8. Lakes - The Department will classify lakes with regard to their recreational, waterfowl, sport fishing potential and advise the company of the classification. Three general classifications will be recognized:

- (1) Lakes and water bodies with little or no recreational, waterfowl, and sport fishing potential. Around these lakes no roads, landings or bared areas will be located within 5 chains of the high water mark. On lakes exceeding 40 acres in area no roads, landings or bared areas will be located within 3 chains of the high water mark, except after inspection and approval by an officer of the Department. If removal of timber is approved, no machinery is to operate within 1 chain of the high water mark, trees are to be felled away from the water and no debris is to enter the water body.
- (2) Lakes and water bodies with waterfowl and sport fishing potential equivalent to or in excess of Canada Land Inventory Class 1, 2, 3 or 4. Around these lakes no roads, landings or bared areas will be located within 5 chains of the high water mark. On lakes exceeding 10 acres in area there will be no timber removal or disturbance of any kind within 3 chains of the high water mark, except after inspection and approval by an officer of the Department. If such removal is approved, no machinery is to operate within 1 chain of the high water mark, trees are to be felled away from the water and no debris is to enter the water body.
- (3) Lakes and water bodies with recreational potential. The Alberta Forest Service will identify such lakes, and advise the company





of them, probably on maps. The Forest Service will delineate the area to be reserved on the ground and on appropriate maps. Any timber removed from reserved areas will be removed by the Forest Service, and the company will have first refusal at current pulpwood prices to acquire the wood removed. Such reserved areas may be formally deleted from the agreement area at the request of the company.

9. Highways - Timber in cut areas located along highways will be treated in the same manner as timber in other cut areas, except that the company will undertake to fell snags, and undertake prompt scarification or other reforestation treatment with a view to avoiding any unsightly accumulation of slash or debris.

10. Road Standards.

(1) Location

- (a) Gradient - Grades shall be kept to a minimum wherever possible, but where steep grades are encountered special control measures may be required.
- (b) Reserves along Watercourses and Lakes - Refer to Section I and II.
- (c) Major Flood Plains - Wherever road construction is proposed on a flood plain, the Forest Service and the company will mutually determine whether or not an alternative route is available. When it is agreed that an alternative route is not available, construction employing maximum erosion control will be allowed. At any time after construction has been completed, should any problems occur in the way of damage to the watercourse caused by company negligence in building



or maintaining the road, the company must take immediate action towards rectification.

(2) Construction and Maintenance.

Depending on the type of operation, Construction and Maintenance standards will be set for timber extraction roads, with a view towards:

- (a) Minimizing bared soil areas.
- (b) Preventing stream silt.
- (c) Preventing hazardous accumulation of woody debris.

Standards and time intervals will be established for the revegetation of bared areas.

Once standards are established and approved by forest service for an operation, the inspector will require the company to comply.

11. Where the land borders on a watercourse or water body or contains a watercourse or water body within its boundaries, and the inspector is satisfied that the grazing of domestic livestock near that watercourse or waterbody is causing or is likely to cause soil erosion, bank deterioration or water sedimentation of a serious nature, the landholder shall construct and maintain at such places on his land as the inspector may prescribe, any fences or other structure required by the inspector and which are necessary for the purpose of preventing or alleviating such soil erosion, bank deterioration or water sedimentation.















